University of Illinois
Graduate School of Library Science

OCCASIONAL PAPERS

ISSN 0073 5310

Number 146
November 1980

Shelf Classification Research: Past, Present—Future?

by

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ABSTRACT

More than a century has passed since the first edition of the Dewey Decimal Classification (DDC) system was published, yet there is little agreement today regarding the merits of DDC versus other classification schemes, or even on whether any system for arranging books on shelves is necessary. This paper is a review and analysis of published research in the field of shelf classification in libraries, as well as an assessment of future prospects. Past, present and proposed rationales for shelving books are described; results of investigations, surveys and "user studies" are summarized; and suggestions for further research are presented. Theoretical and practical implications of the various schemes are considered, and related issues such as catalog classification, open access, browsing ease, and user privacy are discussed.

American librarians are generally considered to use shelf classification only as a "mark and park" device, but this neglect of the subject-revelatory potential of classification is in puzzling contrast to their criticisms of DDC and LCC on grounds more relevant to classified catalogs and information retrieval than to direct access in open-shelf collections. Very little research has been done on patron behavior in shelf-classified collections or on how the commonly applied classifications affect that behavior. In this paper the published research and related literature on shelf classification, direct access and browsing are reviewed; proposed and actual shelf rearrangements are described; suggestions for research are made; and prospects for shelf classification in American libraries, especially in a period of increasing dependence on bibliographic computerization, are assessed.

Why Shelf Classification Research?[1]

Research on shelf classification is defensible on the most practical grounds: millions of dollars are spent annually for classifying, chiefly by Dewey Decimal Classification (DDC) or Library of Congress Classification (LCC). And in almost all American libraries, the results are applied to shelves rather than catalogs or bibliographies, as in Europe. Yet, one would not exaggerate to claim that, after a century of experience, shelf classification in American libraries is largely based on assumptions, rather than objectively validated theory or practice. Shelf classification research would be warranted if it suggested partial answers to pragmatic questions like: Is the cost of shelf classification worthwhile? If so, how elaborate should the shelf arrangement be in different types and sizes of libraries?

Although American librarians have frequently been criticized for indifference to classification as anything other than a "mark and park" operation (to the neglect of its subject-revelatory potential), every new edition of a standard scheme like DDC elicits complaints on the intellectual and economic burdens of reclassification imposed by additions, expansions and relocations. These complaints will not likely decrease. Vann has predicted, "Despite the concern for the length of notation, it does appear as if the unabridged editions of Dewey will expand towards bibliographic fullness even though its daily application is limited largely to 'shelf' classification analysis."[2]

The paradox remains: since we use classification principally as a locational device, there would seem scant reason for intellectual anxiety about the shelf order, due to edition changes, no longer mirroring the logical sequence of the printed scheme. Such anxiety would be more understandable if the classified catalog were not the exception in American libraries.

As collection sizes increase, so do theoretical and practical difficulties of maintaining shelf classification with relative location, either with DDC or LCC. A.C. Foskett in 1972 summarized pessimistically:

> The Library of Congress is now facing a dilemma which is facing all large libraries, the problem of maintaining its stacks in a relatively inefficient arrangement for shelving books. My own belief is that economics are going to force librarians to abandon shelf classification in stacks not open to the public in the not too distant future, a point first made by Fremont Rider as long ago as 1944 in *The Scholar and the Future of the Research Library.*[3]

Although Foskett concedes there is no point in detailed subject arrangement if there is not open access, he evidently is apprehensive that his predicted closed-stack policies may spread to hitherto open-stack libraries: "As far as the academic or research library is concerned, this will perhaps not be too much of a burden but we have to consider the effect of such a trend on the public library service also."[4]

The traditional rationale for shelf classification rests on assumed values of open access to juxtaposed subject-related materials: browsability, serendipity, self-instruction for the layman, research suggestiveness to the scholar. Ranganathan esteemed open access as "the greatest human contribution of the library profession."[5] He described the ideal bibliothecal classification from the user's point of view: "The shelf arrangement should display the full field of a reader's interest, unexpressed as well as expressed. When he looks along the shelves of the library, he should find there what he was only vaguely conscious of wanting; indeed it is only then that he will be able to realize exactly what it is he wants."[6]

Methodology of Past Research

It would appear, then, that research into the problems of shelf classification should center on user needs and satisfaction: Can the growing expense and complexity of such classification be justified by its benefits to patron and/or librarian? Can the needs and benefits be identified, measured and—ideally—anticipated for library policy and implementation? However, very few library use and user studies have attempted to examine patron behavior directly in shelf-classified collections. The numerous reported studies have almost all been concerned with what happens *before* and *after* the patron utilizes the collection. Such studies have sought to learn, through interview, questionnaire or diary, what the patron did at the card catalog before going to the shelves; or, by circulation record analysis, what the reader removed from the shelves; or, by citation analysis and reference counting, what sources the researcher apparently needed. Neglected by these studies have been the intermediate activities of the use at the shelves, such as discarded approaches, changes of subject focus, and use of a book only for a citation to locate another book. Such information on user behavior would have obvious value in the design of shelf classification schemes. Nor have the methods and results of the reported studies been enthusiastically appraised: Frarey and Dunkin questioned the value of more catalog use studies, Taube that of user studies (at least of scientific information), and Brodman of citation analysis.[7]

Most testimony in defense of shelf classification has been subjective and intuitive. Nonlibrarian scholars have, since the introduction of open-shelf collections, eloquently praised direct access with its browsability and chance for serendipity. In 1890 Prof. James K. Hosmer, a humanist scholar, extolled at an American Library Association conference the values of research-browsing in open-shelf collections, even though these collections were, from our modern viewpoint, quite broadly grouped. The rise of open access in public libraries here and in Britain during the last quarter of the nineteenth century was linked to the need for democratic self-education. Dewey, who had created his scheme for a classified catalog, accepted, after brief reluctance, the use of DDC for open shelves in public libraries, no doubt because he considered all his activities but facets of his determination "to make *popular* education my life work."[8]

The specific technical problems involved in research on shelf classification are numerous: subject headings vis-à-vis classification; general *v.* special schemes; utility of mnemonic and expressive notation; "broad" *v.* "close" classification; influence of shelf level; existence of adequate nearby working space; parallel shelving sequences; and—last but surely not least—the presence or absence of books at the time of search.

Moreover, these specific problems ramify into almost every other area of librarianship: selection and acquisition policy; differing interpretations of the browsing concept for research and nonscholarly use; how to identify and store less-used or obsolescent materials; divergent philosophies on the desirable extent of readers' services and reference assistance; the worth and form of independent study in the library; suitability of LCC or DDC for various types and sizes of libraries; increased use of microforms and computerized bibliographical records; appropriate educational, social or scholarly functions of libraries. It will not be surprising, therefore, that much library research, though not focused on shelf classification, bears on its problems and dilemmas. For example, many American national library surveys have yielded data on bibliothecal arrangement.

National American Library Surveys (1876-1927)

The 1876 report, *Public Libraries in the United States of America*, presented varying opinions on the merits of open access: Winsor and Mathews disapproved of it for public and college libraries, respectively; Robinson advocated it for college libraries; Cutter felt that "books are their own classed catalog, better than any that the librarian can make."[9] Throughout the 1876 *Report*, the benefit of direct access, even at a time of generally used "fixed location," was cited as an aid to research and self-education. (It should be noted that "fixed" location did not prevent subject and form groupings on the shelves. Fixed location was only partially "fixed." It was usually applied to individual books within *groups*, which were placed in relation to each other. The need to shift groups of books to allow for additions in adjacent groups could become, as it is today, a major housekeeping problem.) Objections to direct access emphasized problems still with us: disarray and pilferage.

A national survey by Kephart in 1893 studied technical problems If shelf classification: broad *v.* close classification, movable *v.* fixed location, and mnemonic or expressive *v.* non-mnemonic or nonexpressive notation. Kephart found difficulty in reaching conclusions. About the only major points of agreement reported were that books should be classified on the shelves; that most libraries modified available printed schemes; that a movable location was generally preferred to a fixed one; that the tendency was toward close classification, though it was warmly opposed by many; and that mnemonic notations were condemned by a majority. Kephart recommended cooperative cataloging—though he was not sanguine as to its imminence—and he especially warned against expressive notations which "enslave" their classification schemes: "The object of a notation is

to enable us to find or replace a book with ease and certainty. Anything that interferes with this is a mistake."[10]

An 1894 survey by Steiner found one American library fully accepting the policy of direct access,[11] but thereafter—particularly with the opening of the Free Library of Philadelphia—the impetus for direct access accelerated rapidly. The "Committee of Five Report" of 1926-27, which included a special study of shelf access, showed that almost all American public libraries were granting this privilege and that in children's rooms open access was universal.[12]

The educational benefits of open shelves had become axiomatic, though even today these benefits have not been authenticated with scientific precision. Direct access with shelf classification and relative location became an almost patriotic creed, opposition to which raised a presumption of disloyalty to national ideals. Nevertheless, the practical problems of shelf classification kept intruding. Subsequent research, attacking these problems from various angles (sometimes from entrenched positions), have produced disquietingly inconclusive results.

Shelf Policy in European Academic Libraries

Rovelstad has described the rise, decline and partial resurgence of open-shelf policy in European research and academic collections.[13] Until the end of the eighteenth century, open shelves afforded the oldest and simplest means of providing user access. The policy was abandoned during the nineteenth century for administrative, not intellectual, reasons: (1) it was not possible to heat the entire library building, so smaller reading rooms were established apart from the books; (2) growing collections necessitated storage in segregated multitier stacks; (3) increasing backlogs of unprocessed books encouraged replacement of systematic shelving by fixed location according to acquisition (*numerus currens*). We are reminded of similarly "unintellectual" nineteenth-century opposition by librarians to open shelves in American libraries, i.e., the fears of pilferage and disarray as noted above.[14]

Only since World War II, according to Rovelstad, have German university libraries begun to create "institute libraries": closed stacks for specialized research material and open-shelf divisional reading rooms for underclassmen and general readers. The divisional reading rooms offer a "scaled-down version" of the entire collection.[15] Rovelstad recommends this German compromise for American academic libraries, but without mentioning the separate open-shelf undergraduate libraries like those at Har-

vard and Michigan, which seem to have anticipated and perhaps inspired the German development.

Kelley on Shelf Classification *v.* Subject Headings (1937)

A rare direct approach to the investigation of shelf classification from the user's point of view was undertaken by Kelley, who in 1937 published her influential *The Classification of Books: An Inquiry into Its Usefulness to the Reader.* The book was based on a 1934 doctoral dissertation, "The Classification of Books in Terms of Use, with Some Regard to the Advantages of the Subject-Catalog."[16] In effect, Kelley conducted a user study of herself. According to Kelley, librarians made dubious assumptions on the value of classification. These assumptions, though perhaps unconscious, produced obvious consequences. She conducted two investigations relating to one of these assumptions, i.e., "that detailed classification will bring together on the shelves the major and most important resources of a library on specific subjects."[17]

In her first investigation, "How Systematic Classification Works," she tabulated for both DDC and LCC "the general steps which must be taken to ascertain all of the existing material on a specific subject both within and without a definite library."[18] She chose three subjects from the field of zoology: beaver, bison and cormorant. This first investigation showed that for these definite subjects, only about 5.9%, 2.2% and 5.7% (respectively) of all the material in the library on those subjects would be found under the class number.[19]

Her second investigation, "Distribution of Titles under Specific Subjects in the Dictionary Catalog," sought to determine the average amount of material on a specific subject which would be found under its class number on the shelves as compared with the amount to be found under the same subject in the dictionary catalog. Four large, well-organized libraries were studied: University of Chicago Library, Library of Congress (LC), Massachusetts State Library, and Northwestern University Library. Two used LCC and two DDC. This second investigation showed that "of all the material on a subject which is brought out under that subject in a well-made dictionary catalog, one-third is shelved under the subject's specific class number, one-third appears in the form of analytical entries shelved with the main series, and one-third is shelved elsewhere."[20]

Kelley concluded that "the results of both investigations emphasize the fact that consultation of the shelves under the arrangements of books produced by our present methods of classification furnishes, oftentimes, the merest

starting point in locating material on a given subject."[21] Her overall judgment was that one should place less reliance on consulting the shelves for desired material. She favored the subject catalog over shelf classification and advocated changing to broad classification on the shelves, because: "three times as many titles on specific subjects can be traced under the subject in the dictionary catalog as can be found by direct consultation of the shelves;...there is no assurance of finding the most important contributions under the number;...the use of classified books is but one of many steps to be taken in searching for subjects."[22]

Although Kelley's methodology and conclusions were dismissed by Sayers and Bliss,[23] her findings were reputed to have considerably dampened enthusiasm for a close shelf classification and even to have affected the broader classification policy of DDC 15.[24] That edition was excoriated as a disaster; Eaton proclaimed that DDC was now defunct.[25]

Opinions on Shelf *v.* Indirect Approach: Stevens (1953, 1956); Jackson (1956); Tauber (1957)

Some support for shelf classification came from Stevens, who reported in 1953 on his survey of three decades of research into the scholarly use of library materials. His principal interest was in the results of citation analysis. Though not a conspicuous champion of direct research at the shelves, he pointed out that great sets of books must be made directly available to the scholar because he often "does not know what part of the set he needs; he must work through the whole set or use many parts of it simultaneously."[26] In 1956 Stevens expanded on this rather modest recommendation: "The social scientist and the humanist must have freedom to range, with more or less purpose, through books in many fields and cannot be restricted to requesting the items he needs by author and title."[27]

Jackson's 1956 *Catalog Use Study,* the most ambitious up to then, produced a puzzling lack of evidence on the relationship between catalog search failure and shelf access policy: "The effects of open or closed-shelf policy are not clear."[28] The director recommended for future study the effectiveness of the card catalog in comparison with the direct shelf approach. Mostecky, editor of the study, reported that one out of ten patrons of five college libraries used the subject catalog only "to determine the most frequently assigned classification number under a heading and preferred to make his selection directly from the shelves, thus combining the strong points of the alphabetical catalog with those of the classified arrangement to the best advantage." He advised the inclusion of classification numbers on guide and reference cards in the catalog.[29]

In his 1957 survey of the Shelflisting Section of LC, Tauber reported on the "Dependence by Readers and Staff Members on the Classification (on Shelves or Shelflist)":

> It is evident in the replies from the librarians that a classified arrangement of books on the shelves provides the kind of subject approach that is useful to the staff and the clientele who have access to the stacks. Even this testimony, however, has to be weighed for what it is worth—opinion based on experience....A recent survey of the library services at Columbia University revealed that the faculty members and students overwhelmingly supported access to the shelves, even though it was pointed out that closed shelves led to a finer control over the materials.[30]

Herner Study of Stacks Use in the Library of Congress (1960)

Although Tauber in his survey of the Shelflisting Section of LC had advocated use of shelf classification in open-shelf libraries because of the "unmistakable preponderant opinion indicating dependence on the classified arrangement...for those persons who require a subject breakdown of the materials acquired by the libraries,"[31] LC sought further testimony. Much concerned with the cost of maintaining its shelf classification, LC commissioned in 1960 a pilot study by Herner of how its stacks were being used. Interviews were conducted with patrons in the stacks. Among Herner's findings was that the majority of interviewees were looking for specific books for which they knew the call numbers. Only a minority were browsers with no specific books in mind. Among the possible implications was that certain subjects areas were so seldom visited by either specific- or nonspecific-book searchers that these books might be stored by fixed location. Improved cataloging and delivery service could drastically reduce the need for personal visits to the stacks.[32]

Dubester, in his review of the Herner pilot study, declared the need for broader research since "the questionnaires were not designed to show whether these individuals could have obtained the needed information if access to the stacks had been denied them."[33] Indeed, Herner had indicated he had been unable to distinguish by means of his questionnaire specific-book seekers from browsers in the stacks: "From the types of information that the interviewees were seeking, it would seem that a high proportion of both groups would have little need for direct access to the stacks if they had a better familiarity with the facilities and services of the Library, and if these facilities and services were improved."[34]

Some of the following ten answers were given by "specific-book seekers" and some by "nonspecific-book seekers" or "browsers" when the question

was asked in the Herner study: "Could you tell me the specific information you're looking for right now?"

> Local history of the Province of Quebec.
> I'm looking for a *Congressional Quarterly*.
> Content of the book.
> Making a bibliography on technological developments in urbanization.
> Brain surgery.
> Place a man lived in.
> P.G. Wodehouse's works.
> How to dope race horses.
> Checking the construction of women's wear.
> Critical biographies on Walt Whitman.[35]

The first five responses were from "specific-book seekers," the second five from "nonspecific-book seekers"!

Studies by Fussler/Simon and Bowen of Browsing in the University of Chicago Library (1961)

In 1961 Fussler and Simon published their report on the use of books in the University of Chicago Library—part of the long-range planning for a new building. (A re-edited version with unchanged conclusions appeared in 1969.) Their study focused on the assumption that: "in American university libraries...all books not actually in use should be momentarily available and should be shelved with all other books related to the same subject....The presumed necessity for the momentary availability of books may deserve more critical examination."[36] Thus, part of their study was to be devoted to "browsing and non-recorded use."[37]

Fussler and Simon were faced with a critical methodological problem: How does one study browsing or nonrecorded use? They described the difficulties of finding an effective method:

> In studying non-recorded-use it is difficult to define the unit of behavior that will be counted as "use" in such a manner that the unit is unambiguous and practicable to count. For instance, it is possible to count all books that are left on reading tables. But many books are used in the stacks and then replaced by the readers....
>
> Or, an observer might follow a reader and observe his behavior. But the behavior will almost surely be affected by the presence of the observer. Furthermore, this technique runs into either exorbitant cost or difficult sampling problems....
>
> Nor does there seem to be a satisfactory mechanical or electronic method of describing browsing. The number of readers is sufficiently small, and stack areas are sufficiently large, to make a motion-picture or closed-circuit TV procedure impractical since cameras would have to be placed either in many different areas of the library or on the reader's head.

> Furthermore, such techniques are unlikely to tell us *which* books were used and which were not.
>
> Perhaps the best unit of behavior for counting purposes is "touching the book."...To determine the value of browsing contacts that take place, we must also separate the contacts into categories of value. And we must determine which contacts would not have taken place under a different library organizational plan.[38]

Fussler and Simon chose a variety of the diary technique whereby the patron was to check off items on a highly structured questionnaire, copies of which were inserted into a sampling of books. One finding was that books not often charged out also developed little browsing use and thus might be safely removed to compact storage on the basis of *predicted* recorded use.[39]

Their conclusions on the nature of browsing were, however, admittedly tentative. They were unable to ascertain the influence of shelf level on use. They conceded that the freedom to browse freely in stacks was cherished by American students and faculty members: "There is a reader satisfaction and an efficiency in examining books directly that cannot be matched through present library catalogs, reference aids, staff, etc., for many kinds of readers' needs. Furthermore, open browsing permits a kind of serendipity perhaps—but not necessarily—less likely to occur if readers are required to use bibliographies, card catalogs, and other intermediate devices for a portion of their needs."[40] However, Fussler and Simon cautioned that because of the complex requirements of proper book acquisition, shelf arrangement and book availability, "every good scholar knows" that "browsing alone cannot serve as a satisfactory base for a serious literature search."[41]

In 1960 Bowen further explored at Chicago one aspect of the Fussler and Simon study by attempting to augment and recheck the findings on browsing. In a more direct procedure than that of Fussler and Simon, she presented readers in the stacks with questionnaires which would elicit information about the next four books touched. She hoped that this approach "would provide data giving a clear idea of the number of books used by browsers in a day, by whom they are used, what kind of materials are involved and their value, and how they are found."[42]

Among Bowen's findings, derived from a two-month survey, were the following: (1) the type of person who browses is typical of the general population of an academic library; (2) only 5.3% of all materials used were found by "true browsing" methods, the rest by the card catalog and related means; (3) the card catalog produced the more valued materials, whether

checked out or not; (4) materials used by browsers generally did not vary much from the total collection's subject distribution; (5) shelf level showed no significant influence on the proportion of books found by browsing rather than by the card catalog; and (6) almost half the people interviewed in the stacks might very well have obtained their materials through non-browsing means, e.g., the card catalog.[43] The last confirmed a finding of Herner.

Bowen's conclusions were cautious: "For most people the card catalogs serve as an adequate guide to the collection, but in a scholarly community a few browsing uses may be important enough to justify an elaborate structure to support such access. Therefore, averages and medians are not particularly satisfactory guides to the value or importance of browsing, but are the only ones possible in this kind of generalized study."[44] Bowen emphasized for future research the need: "to get a total picture of a person's actions in the stacks and of all the materials that he consults. Basic to all further browsing studies is a better idea of what is in the stacks to begin with."[45]

Opinions on Shelf Notation Readability: Wiley (1919) to Hoage (1960)

A legitimate concern of shelf classification research is whether the patron understands the notation—or, indeed, needs to. This much-debated question relates to the desirability of expressive and mnemonic symbolism. Sayers, Bliss, Metcalfe, Dunkin, Savage, Wiley, and Bostwick—and no doubt many others—have depreciated the need of the patron to be able to "interpret" the notation.[46] Still, it seems necessary for the patron at the shelves to realize that there is an order *resulting* from the placement of the books according to notational symbols.

Librarians, however—as in Kephart's time—continued to attack the excesses of notational mnemonics. Wiley, librarian of the Naval War College in Newport, commented sharply in 1919:

> One of these ornaments to notation is mnemonics, the value of which is as difficult for me to understand as its spelling....
>
> If I were asked, what is the best system of notation, I should frankly admit that I don't know. All of them seem reasonably bad, i.e., none unites the qualities of brevity, clearness and expansibility, and when adapted to a very minute sub-division, all of them look very much like the picture of the Cubist lady descending the stairs.[47]

In her 1960 study of the use of LCC, Hoage reported that most patrons used the classification as a locational device. Most of the librarians she inter-

viewed believed their "average" patron did not fully understand the subject approach represented by the classification notation. She recommended more extensive study of "the patron's typical behavior—visits made to the shelves compared with those made to the library;...comparison of the terminology of the patron with that in the schedules, substitutions made by the patron."[48] (The elaborately expressive and mnemonic notation of Ranganathan's Colon Classification (CC) was judged impractical even by its admirers, one of whom, Coates, developed in 1960 a faceted musical classification especially known for its reversible nonstructural notation.)[49]

Study of Browsing at Johns Hopkins (1961-62)

A 1961-62 Johns Hopkins University library usage study, employing operations research (OR) and systems engineering methods, investigated the value of browsing and how seriously it would be affected by less accessible arrangements or by closed-stack policies—issues motivating also the studies of Herner, Fussler and Simon, and Bowen. The primary purpose was "to construct a picture of the activities which make up a library day. Such a picture had never been constructed at Johns Hopkins or, to the best of our knowledge, at any other research library."[50]

One conclusion was that a significant number of wanted items was found by browsing, and that this pointed to an "open shelf policy as desirable."[51] Another conclusion, contrasting with that of Fussler and Simon, was that "circulation volume is not suitable as an index of the intensity of use of material within the library."[52]

The systems engineering researchers at Johns Hopkins found themselves stalking elusive quarry in the person of the library user, and they commented perhaps ruefully: "In conducting research on human activity one often finds the results to be less clear cut than had been anticipated....We had anticipated a much more detailed picture of library use than actually resulted."[53]

Just as Herner had been unable to distinguish specific- and nonspecific-book seekers, so the Johns Hopkins surveyors found:

> The questionnaire was designed on the assumption that searches for specific items and subject searches were more or less mutually exclusive phenomena; in other words we assumed that if a patron came to the library in search of some particular books he would not at the same time search for material on a subject. In fact approximately one-fourth of the returns were from patrons who had conducted both types of search, and the design of the questionnaire did not permit a satisfactory separation of

that portion of their activities attributable...to the subject search. In fact the idea that such a separation is realistic is questionable in itself.[54]

Survey of Classification Practice in Britain (1966)

A survey of classification practice in Britain, with special reference to DDC, was reported in 1966 by Davison.[55] In British libraries, DDC and the classified catalog were overwhelming favorites. Respondents expressed a desire for specificity in classification along with brevity in notation. (Maltby, in another connection, has gauged the feasibility of such a combination: "The librarian who wants specificity with short notation and a system which never changes but is always up to date is like an ambitious but unrealistic investor who concurrently seeks extensive capital growth, high income and the maximum security for his money!")[56] The incompatibility of the desired features is no doubt an effect of the differing requirements for classified catalog analysis and for notational symbols in shelving and filing, as will be discussed.

A.C. Foskett interpreted the Davison survey findings: "It is becoming increasingly clear that users are not prepared to tolerate complex notation ...and we therefore cannot afford to use it."[57] Austin felt the survey showed "that the working librarian would tolerate a brief, not overly specific classification notation for the shelves."[58]

Hyman Study of the Direct Shelf Approach (1969)

In 1969 Hyman surveyed 152 American and Canadian librarians through an opinion questionnaire on the direct shelf approach and browsing.[59] Respondents were asked to indicate the extent of agreement with statements derived from a survey of the literature. The questionnaire included 44 opinions on the role of classification in the direct shelf approach, the suitability of the direct shelf approach in various libraries, and role of "browsing" and related activities. Among the opinions presented by the questionnaire were:

> Evidence of a system of library classification enhances the prestige and status of the library profession among the users of the library.
>
> Close relative classification is necessary for effective direct shelf approach to subject materials.
>
> Close shelf classification is as useful and feasible for small libraries as it is for large libraries.
>
> Shelf classification has much greater value as a locational device...than as a systematic subject approach.
>
> Subject headings in the public catalog are more useful to the patron than shelf classification.

The value of open-shelf access is primarily conditioned by the quality and appropriateness of the library's collection.

The smaller the library, the more valuable is open-shelf access.

Open-shelf access is more needed by readers in the humanities than in the sciences.

The more advanced the student or researcher in academic libraries, the less need for open-shelf access.

Dewey Classification aids browsing.

LC Classification hinders browsing.[60]

Among the findings were that librarians expressed uneasiness with the function of library classification, and that a consensus on the role of classification in the direct shelf approach did not emerge.[61] Reviews of the study by some American practitioners evidently reflected such attitudes. A public library readers' adviser objected:

> Usually I keep my underwear neatly arranged in my bureau drawers, stockings all together, pairs mated. When I get up in the morning to go to the library for a day's work, it's easier to find stockings to wear that way. It's handy. I don't expect a gold star for it.
>
> Library classification is not too different, only a little more complicated. I'm glad most of those respondents didn't get high faluting about DC and LC and status enhancement.[62]

A high school librarian opined: "For Hyman the key to browsing is the arrangement of the collection....Indeed, much of the books seems less an attempt to show that browsing involves all aspects of librarianship than to show that cataloging and classification do."[63] However, among Hyman's findings was that "in implementing an open-shelf policy through shelf classification, librarians tended to underestimate or to be unaware of the effect of their selection activity on direct access and browsing."[64]

The study concluded that although American librarian and patron preference for the direct shelf approach was unmistakable, the validity of the concept was not given a persuasive theoretical justification. The method for its implementation remained problematical. Major implications of the study seemed to be an increasing reliance on standardized collections classified in centralized processing units by generally available schemes, and a continuing deemphasis of close shelf classification as a subject-revelatory means. Development of a broader DDC, but less broad than the *Abridged*, was recommended for shelving in those libraries for which DDC was more appropriate than LCC.[65]

Study of Readers' Failure at the Shelf in Four British University Libraries (1969-1970)

In 1969-70 a survey was conducted at four British university libraries to measure readers' failure to retrieve books known to be in the collections.

Neither the survey nor its results, reported 1971-73 by Urquhart, Schofield and Seymour, bore directly on shelf classification, but a number of findings and unresolved questions were related at least peripherally.[66] In summary, "nearly all the reader failure at the shelf is caused by other readers using the books rather than by incorrect use of the library by the reader."[67] This conclusion would by implication absolve shelf classification as a deterrent from finding specific known works, but it would also strengthen the widely held assumption that shelf classification is chiefly exploited for locational, not subject-revelatory, purposes. The last inference might be supported by data in table 1.

TABLE 1

BOOKS FOUND BY BROWSING COMPARED TO SPECIFIC BOOKS SEARCHED AND FOUND

Library	*Searched*		
	A	*B*	*C**
Total Number of Forms Completed	1823	859	154
Ratio	0.55:1	0.55:1	1.62:1

*Library C had the highest ratio of in-library use to borrowing, and the highest browsing ratio, but the results here are not comparable because the questionnaire in Library C included items other than books.

Source: Urquhart, John A., and Schofield, J.L. "Measuring Readers' Failure at the Shelf in Three University Libraries," *Journal of Documentation* 28:237, Sept. 1972.

The investigators felt that the survey results posed questions for librarianship in general: Do the results "suggest certain patterns of reader behavior which had not been fully appreciated before? What is the effect of lack of seating on reader borrowing habits? Does it make for more external borrowing and hence less availability?"—and, perhaps more significant for research into shelf classification—"Does the presence of closed access reading rooms draw off much of the failure-creating popular demand?"[68]

Study of Shelf Classification in Eight British Libraries of Various Types (1972)

In 1972 Maltby and Hunter reported a study by the Liverpool and Belfast library schools on the adequacy of shelf classification in eight British libraries of various types: public, university, school, and education college

(normal school).[69] Four classification schemes were represented: DDC, LCC, Bliss (BC), and Brown (SC). Interviews with 1500 readers elicited a generally favorable response to all schemes as applied to shelf classification for browsing and to the catalog for locational marking. Academic library patrons wanted more specificity in shelf arrangement. A general desire was expressed for effective guiding—which Savage would have heartily seconded.[70]

Study of Browsing at the Georgia Institute of Technology (1972)

Greene reported in 1977 on a 1972 study of browsing effectiveness for faculty at the Georgia Institute of Technology. The faculty were asked to specify how they had learned about books they had borrowed and to rate the usefulness of those books. Faculty had learned about the books from: reference in a publication; browsing in the library; colleagues; library catalogs; memory. Although browsing yielded more books than any of the other methods, it was ranked last in terms of usefulness of the books borrowed. Greene draws far-reaching conclusions: "The main argument for the open-stack arrangement of books is that it permits browsing. However, if browsing is the least effective way of discovering books, as the present study suggests, then library administrators may wish to reevaluate the usefulness of costly open book stacks."[71] (One assumes that the reevaluation would extend to shelf classification, since it is generally accepted that closed stacks need not be classified.)

It may be asked if the browsing behavior and goals of a faculty group should be equated with those of nonfaculty users of an academic library. It has been noted frequently in the professional literature that advanced research in any subject is more effectively done by consulting printed bibliographies and indexes than library catalogs, which are almost never comprehensive for the subject under study, or the shelves, where what one finds is dependent, among other factors, on what is not being circulated or used in the library. Even so, to recommend a change of stack policy for all users of a library on the basis of the behavior of a particular type of user seems injudicious.

Shelf Rearrangement in the 1970s

Many small-scale local projects are undertaken to improve the usefulness of conventional shelf classification in open-shelf libraries. There were many during the 1970s. Not all projects are reported, but those that are, despite deliberately modest experimental procedures, often supply helpful

suggestions to other libraries, as well as illustrate typical complaints about traditional shelf arrangement. Following are summaries of projects or proposals involving: shelf-level schemes; proposed alternatives to the Cutter system; shelving by title; shelving by order number; integrated shelving of media, literary types, native and immigrant languages, fiction and nonfiction, and adult and juvenile literature; regrouping of reference collections; rearrangement by interest classifications. During these projects, informal testing was often conducted; the results, though limited in scope, merit consideration by pragmatic practitioners.

Shelf-Level Schemes

As noted, Fussler and Simon in 1961 were unable to state the amount of influence upon use caused by the shelf level, and Bowen in her related study reported that shelf level showed no significant influence on the proportion of books found by browsing rather than by the card catalog. She commented: "This is surprising and suggests that the shelf-level problem should be studied further."[72] Hyman included in his survey questionnaire the following opinion: "The possible physical difficulties encountered in browsing (e.g., bad lighting, high or low shelves, lack of working space, effort in lifting and replacing books) make browsing in most large academic collections an undesirable procedure from the standpoint of most users." Over 60% of the responses expressed disagreement. Typical comments were:

> Some users are confirmed browsers and will put up with bad lights, etc. They'll go to any extent if they are used to it and endure any hardship....
>
> I do not agree. If browsing is a good thing, and I think that it is, I don't think that bad lighting or anything else will make browsing an undesirable activity for the user.[73]

Yet, as a matter of common sense, it seems that, unless a reader needed a specific title for which there was no acceptable substitute, inconvenient placement of books could discourage search and browsing, or even make a sought work inaccessible or likely to be missed. Indeed, some librarians have consciously placed books inconveniently to influence users toward more accessible, "desirable" titles. Thus, Woodward in 1969 described this shelving policy in his science library:

> In this library we try to accommodate the retrieving reader in a number of ways. For instance, we use "middle" shelves before "bottom" shelves to hold our main collection which is subject classified, and we store a little-used special collection on "top" shelves some seven feet from floor level.
>
> The push-down principle we have adopted at a simple level by the creation of two sequences of books. At yearly intervals, we remove from

> the first sequence those books which we consider to be potentially misleading for a reader who may not be an expert but who wishes to discover a currently acceptable statement on his subject of inquiry. These books are a part of the history of science at its most recent creation. We also include in the second sequence books written on the history of science, biographies of scientists, and so on. This is a very cheap way of maintaining a "good" first sequence so long as we have sufficient storage space. Needless to say the first sequence of books is adjacent to reading places and the second sequence is in the stacks. We find that our borrowing readers tend to equate "newer" with "better" in that the mean age of books borrowed is two-thirds of the mean age of all books in our first sequence.[74]

Forbes in 1971 published an analysis of circulation frequency as related to shelf location in English school libraries. He reported that his investigation: "does seem to prove that the height from ground level at which a book is shelved has an effect on the number of times a book is borrowed. At one secondary modern school, for example, on a day when there were forty-two books on issue from the fiction section, only three came from the top shelf (5 ft. 6 in., approx.) and only one from the bottom."[75]

Forbes also conducted an informal experiment: "One morning I took the liberty of moving one of these books...out of alphabetical order from the top shelf to the next shelf down. It was borrowed that same dinner-time—for the first time for three years."[76] He noted that attractively colored dust jackets help to "sell" a book but cannot always compensate for bad positioning. He concluded with the exhortation: "We must in the meantime make the best of what we have by ensuring a steady flow of books from shelf to shelf, so that no work stays too long in a relatively inaccessible place; by this means we shall avoid the formation of those stagnant pools of often worthy, but neglected, reading matter that can be found in many libraries."[77]

Goldhor reported in 1972 on an experiment conducted in two Illinois public libraries over six months in 1969-70. He concluded that prime display stimulated browsing-based borrowing of adult fiction in public libraries. His research was claimed to support the hypothesis that "adults borrow books from the public library primarily as a result of browsing and that what facilitates browsing will significantly increase circulation."[78]

If the above studies seem only to confirm the pragmatically obvious—that inconvenient shelving may be expected to affect adversely browsing and resultant borrowing in open-access libraries—the underlying implications for shelf classification may not be so immediately apparent: strict adherence to *any* scheme of shelf classification will probably in most libraries

produce inconvenient shelving of at least *some* of the collection. As Maltby put it:

> The differences between libraries, even those of the same type, plus such irksome but very real and pragmatic factors as the size and shape of the building or department, all have a very definite effect upon the capabilities of any classification scheme. Even reading and browsing can be strongly influenced by the shelf on which a particular volume is located, shelves which are too high or too near the floor being shunned. Readers prefer books to be housed at a suitable height—to be found within the area which, in certain parts of the United States, has been described as the "zone of convenience." It is virtually impossible to combat physical and psychological limitations of this kind, but they remain as a potential foe to the best planned of systematic sequences.[79]

Most shelf rearrangement projects attempt, by physical regroupings, to deal with the practical dilemma described by Maltby. If the dilemma is not resolved, it is at least sidestepped or its effects ameliorated.

Proposed Alternatives to Cuttering

Most libraries employing shelf classification subarrange works in any one subject group by "cuttering," that is, alphabetically by main entry (usually author), then successively by title, edition date or number, copy number, and any additional necessary filing indication—all incorporated in the "call number" or "shelf mark" of which only the first part usually refers to the subject class. Theoretically, most classification schemes can be supplemented, at least in nonfiction classes, by any type of alphabetical or numerical subgrouping once the subject class or subclass has been determined. (In LCC, however, cuttering can be part of the subject notation.) Accordingly, most departures from conventional cuttering do not change the basic subject shelf order, though added "book numbers" can be made so elaborate as to suggest miniature classification schemes.[80]

An alternative to conventional cuttering was proposed in 1971 by Rydings: in university libraries the books would be classed broadly according to the department recommending purchase and in each of these departmental "corners" books would be subdivided by date of publication and accession number.[81] Rydings thought that conventional large-scale catalogs and classified shelves confused the reader, and that computerized records should replace manual bibliographic tools.

White in 1973 recommended a chronological subarrangement of books according to year of issue instead of cuttering by author.[82] He conceded that this need not be applied to all subjects, e.g., not to literature and philosophy, where the preference might be for author subdivision.

The Library of Congress in 1977 announced plans to close its card catalogs effective January 1980, and to rely thereafter on automated bibliographic access to its collections.* The older catalog is to be "frozen." Among the numerous possible consequences is a change in LC shelflisting operations. According to a January 1978 memorandum, at least two basic shelflisting procedures are being considered: (1) a new shelflist following essentially the present system; and (2) a new system in which the shelflist portion of the number would be either an arbitrary number or a date.[83] The former system: "would have the advantage of continuing to group titles under a given class number by author and by edition. It would *not* group authors and titles across the old and new systems." The latter system: "would have the advantage of grouping the newer books on any one subject together by date, thus providing easy access to the user wanting the latest materials on a given subject. It would have the disadvantage of ceasing to group books by the same author on a given subject, or editions together. Groupings by author or edition would still be found in the catalogs."[84]

Practitioners have already complained that such changes would seriously affect the open-shelf arrangements of libraries using LCC. Still undiscussed by LC is that such a new shelflisting system might make unnecessary shelf classification and an open-shelf policy for its own collection: browsing might then be better done by computer consultation than by inspection at the shelves. The previously noted 1960 Herner study of stacks use in LC, as well as A.C. Foskett's 1972 prediction of the demise of shelf classification in large libraries such as LC, are brought back to mind. Portents are becoming grim for advocates of classified open shelves.[85]

Shelving by Title

Neither Rydings nor White (nor, as yet, LC) have proposed abandoning shelf classification. Much more radical have been the recommendations, realized in some libraries, that the *basic* arrangement of shelved items and/or catalog entries be by title. Urquhart reported in 1971 on the shelving policies of the National Lending Library for Science and Technology (NLL), Boston Spa, England—now the British Lending Library (BLL)—which shelved its periodicals and most of its books in alphabetical order by title, and which was described as not having a catalog in the usual sense. Although Urquhart admitted the special conditions at NLL, of which he was director—i.e., no need for open access, a centralized lending service chiefly for periodicals—he suggested that serious attention be given by librarians generally to "the possibility of shelving publications so that

*LC has postponed the closing of its card catalogs to January 1981.

they could be found without consulting any record....The experience of the NLL suggests that considerable economies in operating costs in many libraries might be possible."[86] Of course, Urquhart's suggestion, if applied to *all* library materials, would eliminate shelf classification, but even now most open-access libraries shelve at least their recent periodicals by title, and this usually obviates catalog consultation by readers.

Bennett in 1971 also suggested that NLL shelving policies might be profitably adopted by other libraries, especially in many specialized collections whose books may account for less than 10% of the total stock: "The main problem is to find an item, not to record it. Thus, the shelf location function of the catalogue combined with a consultation of the loans file is sufficient to indicate whether an item is in the library."[87] He recommended for pamphlets an alphabetical arrangement by the issuing body. Descriptive and subject cataloging information for books could be obtained from published bibliographic tools, and "subject bibliographies could be built up systematically after each significant search, making rapid keys to retrieving information."[88] He appeared to limit his book-shelving suggestions to libraries with less than 750 volumes. Maurice Line, Urquhart's associate at NLL and now director of BLL, described in 1972 "a study of comparative costs and merits of (a) shelving of monograph stock by title, without catalogues, (b) title shelving with catalogues, and (c) numerical (sequential) shelving with catalogues." The "very surprising" results were that numerical shelving with catalogs seems to be at least 20% cheaper than title shelving with catalogs, and no more expensive than title shelving without catalogs. Yet, "the potential benefits of having some record of stock, in however simple a form, are too great to be ignored." Line warned that the results were applicable only to the National Central Library, and not to university libraries which do not obtain most books with accompanying inexpensive catalog records on blanket order, "and where subject access is desirable."[89]

Daily and others have urged that the title replace the author as the main entry in bibliographic records.[90] For computerized data files with multiple-access retrieval capabilities, the nature of the "main entry" is inconsequential; indeed, a computerized data base does not require a conventional main-entry heading. However, a change to title as the main *shelving* medium would mean the end of shelf-classified collections and the acceptance of the call number as solely locational, with no claim to a subject-revelatory function. Title filing of in-process records has been adopted by many libraries, including LC, but this has not yet led to a similar shelf arrangement.

Shelving by Order Number

Gore, a college librarian, has described a shelving scheme for new books in which the call numbers are the six-digit order numbers assigned in serial sequence when the books were ordered. Thus, books are shelved chronologically by order date. "Subject relationships were random and chaotic....A year passed...this randomly arranged collection grew to about 5000 volumes...nobody objected. The collection was being heavily used, at a rate double that of the general collection, despite its chaotic arrangement and despite the lack of catalog access either by authors or subjects."[91]

The purity of notation and of unclassified shelf arrangement could not survive the collection's growth. When the collection reached 5000 volumes, Gore found it necessary to create 25 general subject groupings whose alphabetical notations, taken from LCC, were used to prefix the order numbers. None of the 25 groups, of course, approached the 5000-volume size. (At this point Gore seems to have arrived at a shelf rearrangement not too different from those of Rydings and White, which grouped books first by subject and then by publication or accession date.) Use of the regrouped collection did not attract an expected greater use until it was decided to leave the dust wrappers on these new acquisitions, whereafter the rate of use increased by 50%. (The effect of keeping the dust wrapper has also been noted by Forbes.)[92]

The collection is no-growth and comprises only books between one and two years old. The older books are permanently cataloged and transferred to the general collection. Clearly, Gore is describing a variation of the "new books browsing collection" familiar in public and academic libraries. Gore's collection differs in its larger size and, perhaps paradoxically, in its more elaborate subject and chronological organization. Most public and academic librarians would be content to group their new acquisitions simply as fiction and nonfiction.

Gore, well known for his iconoclastic approaches to bibliographical organization, drew from this shelving experience the conclusions that: (1) new books were, on the average, of greater interest than older ones; (2) readers disliked catalogs and preferred to bypass them as much as possible; and (3) "a collection of 5000 books in a state of near-zero bibliographical control is not so large that the brain feels 'overwhelmed and confused by a mass of largely useless and irrelevant knowledge,' provided that the brain knows that a relatively high proportion of the books in that collection will be more than ordinarily useful and appealing."[93] This last conclusion regarding users' threshold of tolerance for bibliographical disorder (or entropy) might have more significance if it were not derived from an

apparently noncritical, nonresearch situation in a relatively small college library.

Integrated Shelving of Media

A trend favoring shelf classification is represented by various projects and proposals to integrate physically all media in libraries. Kennerly stated in 1972 the rationale for such integration: "If we accept the idea of nonprint media as normal library holdings, then we should also accept the idea of integrating them into the collection of printed materials. In theory, everything on a given subject should be classified so that it can be shelved together, with materials on related subjects nearby."[94] She appreciated, however, the practical difficulties: "Even if we are not quite ready for physical integration of all our library holdings, we can accomplish much the same organization by classifying all nonprint materials, using exactly the same system as for books."[95]

Most reported projects have been in school libraries or instructional media centers (IMCs), not advanced academic or research institutions. A manual originally prepared for school libraries by ALA and the Canadian Library Association, *Nonbook Materials: The Organization of Integrated Collections,* has been the chief model for AACR's revision of its nonprint materials provisions. As its title implies, it recommends an integrated catalog for all materials and, insofar as possible, integrated shelving. The anticipated benefit to be derived from the latter is that of shelf classification.

Reported examples of integrated shelving in school libraries are provided by Villemonte and McCarthy. Villemonte, librarian at the Odana Elementary School, Madison, Wis., reported in 1973 on shelf integration accomplished in fall 1971: "If students are to use them effectively, the materials must be organized by the subject treated and be made openly available for student examination and use....The Odana IMC has filmstrips, cassette tapes, reel tapes, records, loop films, transparencies, kits, sets of records and filmstrips."[96] Villemonte was enthusiastic about results discussed in her article, "Integrated Shelving; A New Convenience for a Few Dollars," though quantitative data were not supplied. Exceptions to integration were noted, e.g., transparencies were placed in manila folders (unless already supplied as sets in transparent folders) and placed at the end of the shelf dealing with the particular subject. Some repackaging was required: "Many of the combination record and filmstrip sets are very cumbersome. At this moment they are on the shelves in their subject area, and we are beginning to transfer the material on the records to cassette tapes for easier shelving."[97]

McCarthy, media specialist at Eisenhower High School, New Berlin, Wis., in 1975 described six years of experience with integrated shelving of filmstrips, books, paperbacks, cassette tapes, and LP discs dubbed on tapes. McCarthy gave more exceptions than Villemonte, and indicated that not all media had to be stored on book shelves: microforms were kept near microform readers; slides and transparencies in file cabinets were requested from the circulation desk or magazine area; super-8 films, film loops, and 16mm films, because of expense involved, "might be better handled on a request basis."[98]

McCarthy rebutted objections usually raised against integrated open shelving. Filmstrip theft or mutilation was not a problem. Erasable and reusable cassette tapes were stolen, but replacement costs were minor. Valuable shelf space was used up, but the space had to be used anyway. She claimed it took no more time to process nonprint materials for open shelving than for other storage. The results were noted enthusiastically: "For the first time in our IMC work, we see students actively using the card catalog....They appear more frequently to consult it in order to find where the materials are located in the IMC rather than using it as a bibliographic tool." Furthermore, "circulation and usage of print materials (books, magazines, reference titles, pamphlets, reserve books) increased astonishingly when we organized for easy access to non-print materials and equipment."[99]

A possibly significant factor was hinted at by the observation that students generally used the equipment and materials in the wet (wired) carrels and were not "excited" about taking the media home for overnight use. Perhaps student interest in nonprint materials resulted from instructional policy reflected in the development over six years of a full-fledged IMC. In other words, were the positive effects noted by McCarthy due more to teachers' assignments than to media integration per se? In any case, McCarthy concluded: "After six years of accentuating the positives here at Eisenhower IMC, we're confident that integrated shelving of materials is here to stay."[100]

Integration in school libraries may not be very important for shelf classification in academic and research libraries, which usually apply either LCC or DDC. Shelf arrangement in school libraries and IMCs ordinarily consists of broad classes from the abridged DDC, as recommended by *Nonbook Materials* and most authorities on organizing such collections. Vivian Schrader, head of LC's Descriptive Cataloging Division Audiovisual Section, explained at a 1976 seminar that LC does not collect nonprint materials below the university level, but that it has supplied since 1952 printed cards with abridged DDC numbers for such materials.[101]

Integrated shelving does exist in academic libraries, as attested in 1976 by Robert Veihmann, Director of Technical Processes and Distribution, Learning Resources, at College of DuPage (Glen Ellyn, Ill.), where all media are intershelved. The catalog also is integrated and has color-banded cards for various media. Elimination of the catalog is being considered. DuPage is a junior college founded in 1967 with 15,000 students. In 1975, 8300 books and about 1800 nonprint items were added. The 1976 book budget was $92,000 and the nonbook budget was $50,000. Veihmann claimed that about 85% of the students approved of intershelving. To accommodate the media, 12-inch shelving, instead of the regular 9-inch, is used. Though he admitted that intershelving is expensive, Veihmann noted that regular processing and shelving of books are, too.[102] (McCarthy seems to use a similar argument.)

The needs of the College of DuPage would appear closer to those of IMCs than to those of four-year college or large academic and research libraries. The latter still tend to keep their nonprint items in special areas or cabinets, which are often not directly accessible. At least a partial exception to this policy was described in 1975 by Jacqueline Maxin, librarian at Clarkson College of Technology (Potsdam, N.Y.). In the latter half of 1974, this library, which has 1525 periodical subscriptions and receives 2 newspapers and 135 journals on microfilm, began placing the entire journal microfilm collection next to bound volumes for the past two years (the most heavily used volumes). Although Maxin concluded that "open shelving can be an efficient, effective, and economical means of housing journal microfilm," she cautioned:

> It may well provide small academic and research libraries with a viable alternative to microfilm storage in cabinets or in nonuser areas, provided the library is in a temperate climate or is environmentally controlled. It should work as well for libraries that classify their journals as for those that arrange them alphabetically. It is not suggested for libraries that have extensive microfilm collections, long runs of newspaper microfilm, or large package collections.[103]

Pacey, in a 1975 *Arlis (UK) Newsletter* editorial, raised the perhaps rhetorical question:

> To what extent should the organization of a library be determined by the form of materials (books, periodicals, slides, etc.) and by the way in which they are intended to function (as lending or reference stock, for example) on the one hand, or by their subject-matter on the other? For the specialist library, the question resolves itself: however the librarian organizes the stock, related materials will never be far from each other, while the geography of the smaller library is easier to comprehend.[104]

A general library, however, "should be arranged by subject, which will suit readers and also the subject specialist, who will be located in an area with which he becomes readily identified, with all relevant materials to hand—shelves of books, cabinets of slides and illustrations, and an array of periodicals which is more manageable and approachable for being restricted in quantity."[105]

American librarians might note particularly two points made by Pacey. First, the need for integrated media is not as great in a special library, which inevitably groups by its major subject. Second, even where physical integration is needed, different media require different storage facilities. Pacey wants all media relating to a particular topic in a general collection to be placed in reasonable proximity, that is, in separate but nearby groupings of periodicals, pamphlets or slides relating to the subject, but not on the same shelves as the books. Thus, the general library would *not* have an all-subject periodicals or pamphlets department. It is perhaps noteworthy that it is usually only in smaller, American school libraries that integration of all media on shelves is proposed or attempted. Such libraries would ordinarily not own very extensive nonbook or near-comprehensive subject collections.

Academic and other libraries with extensive collections of any one nonprint medium, e.g., sound recordings, films, microfilms, or botanical specimens, are usually unwilling or unable to integrate such media for open access, but even when the effort is made, conventional shelf classification has not usually been considered appropriate. Music libraries with their books, scores, periodicals, and sound recordings exemplify the problems. Although public, academic and special libraries have long collected sound recordings, usually on discs, there seems no generally accepted shelf arrangement scheme, especially for browsing. Buth in 1975 summarized four methods of shelf arrangement for sound recordings, methods suggested by the Music Library Association and which still account for 80% of the schemes used: numerical, classified, trade symbol, and alphabetical. Buth detailed their merits and disadvantages without making definite recommendation. New schemes continue to be devised, e.g., the Brodart ANSCR (Alphanumeric System for Classification of Recordings) scheme for browsing collections of sound recordings and, as noted earlier, Coates's faceted music classification, which is also applicable to shelf arrangement.[106]

In summary, no significant movement or project has been reported to support advocacy of shelf integration of media in academic and research libraries, or in collections of any size beyond those at the high school level.

The documented efforts at media integration in school libraries and IMCs would be encouraging to proponents of shelf classification in general, except that the efforts appear much less practicable for larger and more complex libraries. Hyman has advanced the merits of nonintegrated media files even when integration on the shelves is not attempted.[107]

Integrated Shelving of Literary Types

Many projects have been reported on integrated shelving of literary types—native with immigrant languages, fiction with nonfiction, adult with juvenile literature. Most, as already noted, are small-scale, local efforts with little "scientific" quantification, but in aggregate they testify to the continuing faith of practitioners in shelf classification with open access as a powerful practical means of meeting the needs of readers representing different social, cultural and intellectual backgrounds.

Integrated Shelving of Immigrant and Native Languages

Söderhjelm reported in 1973 that Swedish public libraries were facing a special problem with immigrant-language nonfiction: should it be shelved by subject or by language?[108] She recommended, on the basis of observations of differing practices in her own and other libraries, the shelving of mixed languages by subject. This recommendation is at variance with American practice. Urban public libraries in the United States have, since the nineteenth century, traditionally segregated their immigrant-language collections and even supplied separate catalogs. Perhaps Söderhjelm's approach should be tried.

Integrated Shelving of Fiction and Nonfiction

Another problem not ignored in the United States has been the ideal relationship between fiction and nonfiction in open-shelf public libraries. Education-minded American librarians have, since the middle of the nineteenth century, deplored the popular taste for "desultory novel reading" and consequent neglect of morally uplifting and career-enhancing nonfiction. Winsor, in his "Reading in Popular Libraries," a contribution to the *1876 Public Libraries in the United States of America,* reached "a reasonable conclusion...that the mass of readers in popular libraries crave pastime only; but they can be made to glide into what is commonly called instructive reading quite as early as it is good for them."[109] One method of implementing this transition by readers in open-access libraries from pastime to self-instruction was unconventional shelf rearrangement, sternly evaluated by Bostwick in 1910:

> The desire of the librarian to increase the circulation of certain classes may also cause a departure from strict arrangement. Thus in some

> open-shelf libraries a so-called "ribbon" arrangement of fiction has been adopted, in which the fiction is placed on one shelf around the room, with non-fiction classes above and below it, the expectation being that many users who read only fiction will in this way be attracted to non-fiction books and begin to withdraw and read them. Many eccentricities of shelf arrangement are to be credited to such laudable aims as this. In some children's rooms the stories have been classified and shelved with the non-fiction....The subclassification of adult fiction and its arrangement in corresponding fashion on the shelves has been strongly advocated by some librarians. In at least one library, books in the children's room are arranged by accession number, without classified order, so that the users will be more likely to select non-fiction.
>
> It may be postulated, however, that departure from classified order should be made on the shelves only from some compelling reason. Library users may surely be made to read good books in some other way than that by which rats are induced to take poison, namely, by mixing it with their daily food.[110]

Recent proposals and projects only confirm that there is nothing new under the sun. Emunds, a German children's librarian, proposed in 1973 that fiction be grouped by subject and be provided with age indicators rather than put in separate age sections.[111] He recommended experiments with multiple copies to test such groupings.

An actual project involving the classification of fiction in an American junior high school library was reported by Briggs in 1973. The project had been started two years earlier:

> We removed the fiction collection from the shelves and classified each book into one of eight general subject categories: Story Collections, Fantasy, Sports, Mystery and Suspense, Girl's Stories (labeled Teenage for upper grades), Science Fiction, Historical Fiction, and General Fiction. Each book was then color coded for ease in shelving...and then reshelved, first by subject and then by author....Books that did not fit into the seven other categories remained in General Fiction.[112]

About 3000 fiction books were thus reclassified. In 1973, Briggs took a poll of 430 ninth-graders who had been in the seventh grade in the same school when the new system had been introduced: "The questionnaires were then sorted into two categories: those from students who used the public library, where fiction is still shelved alphabetically, and those from students who used only the school library. Of the public library users, over 78 percent indicated they found the classified fiction system easier to use; over 88 percent of the school library users agreed."[113] Accordingly, Briggs concluded that classifying fiction would be worthwhile, not only for students in grades K-12, but for anyone using a fiction collection of more than 1000 titles. One might note, though, that Briggs's "subject" reclassification was actually by genre, and that public libraries group popular fiction by such

categories as detective, Western, science fiction, gothic, romance—often using pictorial spine labels.

Integrated Shelving of Adult and Juvenile Literature

Public librarians, always conscious of their pedagogical role, have been proud of their efforts to provide suitable books, reading facilities, and guidance for specific age groups, though terminology has often been less specific than confusing and overlapping—e.g., *beginners, children, pre-adolescent, adolescent, teenage, juvenile, young adult.* "Children's rooms" or areas with special furniture and low open shelves have been standard in public libraries for a century. During the twentieth century, more and more specialization in age-group services (and in types of librarians) was developed, particularly for the "young adult." Recently, doubt has been expressed as to whether—except for the youngest children—books on open shelves should be divided between "juvenile" and "adult."

Integration of adult and juvenile books, both fiction and nonfiction, was begun in July 1970 at the Simi Public Library, a collection of 47,418 volumes which ranked second in circulation among the 15 branches of the Ventura County and City Library System in Ventura County, California. Wakefield and Hofmann reported in 1972 that the project after six months was "completely successful" as far as the integration of nonfiction was concerned, but complaints from adults led the librarians, against their wishes, to restore the fiction to separate arrangement. As a result of this project, other branches, including the most heavily used one with a collection of 54,700 volumes, have integrated adult and juvenile nonfiction. The Ventura system plans to integrate nonfiction in all other branches where shelves are no higher than five feet, since a higher shelf level would eliminate use by children. Bookmobiles are also candidates for integration. The tenor of the article is predicted by the rhetorical question in its title: "Combining Your Adult and Juvenile Collections: Certifiable Lunacy or Common Sense?"[114]

A similar public library project with a similar outcome was carried out in Ontario, where in June 1972 the adult and juvenile collections were completely integrated at the Mary J.L. Black Branch Library. Because of complaints from both adults and children, the fiction collection was returned to separate age sections. The advantages of integrated nonfiction, however, were such as to result in the decision to keep them together in the new policy of "semi-integration." Ditmars reported: "Our non-fiction collection will remain as is. Both children and adults are content with subject materials integrated. This allows for a wider range of choice as each person is capable of knowing his own level of competence and can choose

accordingly. Since all books on a particular subject are placed together, the patron is confronted by all the materials held by the library."[115]

An article by Ingram on the same project cited favorable borrowing data: "Circulation statistics for the first post-integration month show an encouraging upward trend which reverses the usual summer decline. During July there was a circulation increase of 12.5% in adult books and a 33% increase in children's books for a total increase of some 1507 books over July 1971 which was recorded at 5783."[116] The new "semi-integration" policy has been applied to other branches, and has led to new borrowing rules to permit children to withdraw adult nonfiction with their own membership cards.

The September 1977 *American Libraries* printed answers to the question submitted by a public librarian: "We have decided to interfile our adult and juvenile nonfiction collections. I'd like to hear the pros and cons from librarians who have done this." Eight of nine respondents "warmly endorsed interfiling adult and juvenile nonfiction if the library building is adaptable." Responses were summarized as follows:

> Advantages:
> 1. All information on one topic is in one place. [In this library system all media are also intershelved.]...
> 2. A reader may seek his or her own level without embarrassment....
> 3. The various levels complement each other....
> 4. Weeding is simple because the librarian can see the total subject picture at a glance.
>
> Disadvantages:
> 1. High shelving hinders small children.
> 2. Children may be overwhelmed by the number of books and cards on a single subject.
> 3. The children's collection may be depleted by adult readers.
> 4. "If open access is a problem in your area, don't try intershelving....You know how kids are going to grab at all those 'nasty' sex books" until "the novelty wears off."[117]

One respondent, John E. Kralick, offered his 1977 UCLA master's thesis on the subject. Kralick first gives a brief documentary survey of previous efforts, chiefly at Thunder Bay and St. Catharines in Canada, and in Ventura County, California, and proceeds to a field study of a similar program in Los Angeles. He concludes enthusiastically:

> Integration is an appealing alternative. It is an appropriate response to today's demands on a collection. Its implementation provides maximum utility of the collection at minimal (no) additional cost....
>
> Integration works, and it works well. To synopsize: it should be seriously considered for small and medium size libraries; a library of up to 100,000 volumes has an excellent chance of integrating successfully.[118]

Advocates of combining adult and juvenile collections point out that—as shown in the above citations—it allows less literate adults to obtain without embarrassment information couched in less sophisticated language, while younger skilled patrons are thereby influenced to attempt reading works more advanced than would be available to them in age-segregated sections. (Many children's librarians remove age indicators from catalog cards because such official categories are thought to deter capable youngsters from reading higher-level books.) In these arguments, one detects the same educational zeal of those nineteenth-century librarians evidenced by such devices as the "ribbon arrangement" of fiction in open-access public libraries.

Regrouping of Reference Collections

Even the staunchest proponents of conventional shelf classification acknowledge that certain situations may require exceptions in the form of parallel shelf sequences, that is, separate groupings of particular types of books outside of the main classified sequence but mirroring its order. Separate grouping of oversize volumes is usual in shelf-classified libraries, as is protected, closed-stacks storage for incunabula and other rare or special works. Separate grouping is also accepted by traditionalists for noncirculating reference works, especially those in heavy demand. Most libraries have a physically distinct department or area where reference tools can be consulted, with a librarian nearby who can aid in their use. Nevertheless, doubts are sometimes raised as to whether the reference collection itself should constitute an unbroken parallel sequence or whether nontraditional groupings are needed for practical effectiveness. Here again, even traditionalists admit that very large and bulky volumes like *Cumulative Book Index* and unabridged dictionaries are more conveniently and safely displayed on tables or reading stands than on shelves in exact classified order. Apart from such exceptions, though, reference collections have been reshelved in various libraries in "broken order" as distinguished from "parallel order"—that is, in groupings inconsistent with the basic classification.

David Kuhner, chief, Reference Department, John Crerar Library, Chicago, described in 1969 a special scheme for arranging reference books, a scheme created by him in 1964 when he was head of reference at the Stanford University Graduate School of Business Library, and still in use there as of 1969. Kuhner cited Truelson, who in 1962 had made "a cogent argument for a similar system" in medical libraries.[119] Kuhner's rationale was that "in the intensively used reference libraries of today, it is becoming increasingly clear that one call number order for all reference works is not the best answer."[120] His scheme called for ten major groupings: an alpha-

betical subject section (the largest grouping), a geographical section, and eight auxiliary sections. The alphabetical subject section was arranged in sequence by the generally accepted names for broad subject fields, e.g., astronomy, biology and chemistry for a science collection. The geographical section followed a sequence of increasing area: the local metropolitan area, the state, other states, the United States as a whole, world data section, and individual countries alphabetically. The eight auxiliary sections were: general industrial and manufacturing directories, periodical and publishers' directories, associations and organizations, biographical and "who's who," education and occupations, foreign-language dictionaries, special bibliography and readers' advisory, and quick fact locators. Two locator guides were necessary: a map of the various sections, and a card shelflist available to all. Kuhner claimed that such arrangement increased readers' self-service, but he cautioned that "the scheme works best for only that part of a large reference collection that is intensively used or for a small total collection of books."[121]

A more conventional parallel grouping of indexes and abstracts for the humanities and social sciences was described in 1973 by Thomas Gwinup, Research and Reference Division of California State University, San Diego, who seemed to disagree with Kuhner's claim that "one call number order for all reference works is not the best answer." When the new library building at San Diego was completed, the most heavily used indexes and abstracts were put on 21 tables:

> The overall logical arrangement chosen was the Library of Congress order of subjects, beginning with A on the first tables and ending with Z on the last tables. Most of the exceptions made were to bring near the reference desks items that were both heavily used and frequently in need of explanation as to the small details of their use, such as the various book review indexes, the *International Bibliography* of the Modern Language Association, and the *Public Affairs Information Service*. Also, the business, labor, and tax items were brought together on several adjoining tables, although kept in call number order on those tables. The indexes and abstracts of theses and dissertations were left in the reference stacks, where they formed a rather usable section of their own.[122]

(A policy of keeping the most-used books in the most convenient location for staff and/or readers is frequently adopted for the general stacks of large libraries where certain classes are shelved nearest the circulation desk. Explanatory charts are supplied, of course. Minimum disruption is made in the general shelf classification, since in large libraries the classes are in any case distributed over more than one floor, so that the physical juxtaposition of main classes may not be significant.)

The integration of reference works into the general shelf sequence (or placement on adjacent shelves) in open-access undergraduate libraries has been frequent since the opening in 1949 of Harvard's Lamont Library building. (The concept of the separate undergraduate library has already been noted above in reference to Rovelstad's article.) The 1953 *Catalogue of the Lamont Library* listed in simplified Dewey order some 39,000 titles for a separate open-shelf undergraduate library. The catalog had much influence on other college libraries, certainly as a selection guide and possibly as a shelf classification model. In 1975 Larsen and Eriksen reported on the integration of reference works with circulating subject-classified books in a Danish public library and claimed greater use of the reference works.[123]

Reshelving by Reader Interest Classifications

In the broadest sense, all classification schemes aim to match the interests of the particular library's readers. However, the Reader Interest Classification (RIC) refers specifically to a scheme developed at the Detroit Public Library in the 1940s and widely adopted, in different forms, by libraries of many types. The Detroit RIC temporarily groups books out of regular classification order under such broad interest categories as Current Affairs, People and Places, and Personal Living. Such groupings may be devised for any topic of potential reader interest. As Rutzen of the Detroit Public Library has been summarized by Dunkin: "RIC centers not on shelving books nor on logic, but on people and the fields of interest related to the everyday needs of people. These fields of interest arise from people's concern about themselves as (1) individuals, (2) members of a family, and (3) members of the local, national, and international community. To serve these fields of interest, books are arranged in two kinds of categories: browsing and subject."[124] In short, the temporary and partial application of RIC to a collection are the scheme's distinguishing characteristics.

Custer, editor of DDC, disowned the method: "Some public libraries now organize their collections of works of current popular interest in somewhat heterogeneous groups according to a reader-interest arrangement,...regrouping titles and developing new categories as interests of patrons shift. Practical as this has...proved to be, it is not classification by *subject*."[125] Mills considered it "book classification for the casual reader."[126] Needham denounced it: "*Reader interest arrangement* in public libraries is the outcome of the adverse attitude to shelf classification in its most extreme form....Whilst close classification certainly has its limitations, such a solution to the problem is too drastic, alienating, as it does, the serious reader."[127]

Probably none of the recent projects or proposals described below are faithful examples of the Detroit RIC. The phrase "reader interest" or its equivalent is almost always used by the creators of such schemes, but the phrase clearly is being interpreted much more loosely than in the RIC. For example, Williams's 1973 master's thesis was "a study to determine the effectiveness of an interest grouping classification for primary-grade children." "The purpose was to determine if a subject arrangement of easy fiction books, based on the interests of primary-grade children, and denoted by picture symbols, would make the students more satisfied with, and independent in, their book selections, as compared to an author arrangement."[128] There is here at least a family resemblance to the Detroit RIC. Williams's findings were positive: that the "children preferred the subject arrangement, were more independent and satisfied when using it,..." and that the arrangement probably helps develop "self-worth and independence in small children" and prepares them for comprehension of symbols.[129]

In 1972 Hubbard published a "Public Library Reader Interest Arrangement." Hubbard, Map Librarian at the University of Washington, Seattle, presented two case histories to support his proposals:

> I was lucky enough to start out in a university architecture library, where it was obvious from the start that my customers' needs—visual design by period for history courses, modern design for design courses—were at cross purposes with fine arts classifications based on separate crafts and historically eclectic designing. A seventy-seven percent increase in circulation (1958-1962) followed a color-coded division of the Dewey-classified collection into thirteen browsing collections: General History; Primitive; Mideastern; Classical; Medieval; Renaissance & Romantic European; Latin American; Renaissance & Romantic U.S.; Far Eastern; Modern; Furniture; Landscape; City Planning.
>
> At the 39,000 volume public library in Winchester, Virginia, verbal arrangement of all new and some old adult non-fiction was followed by a forty percent increase in adult non-fiction circulation. Use of children's non-fiction also increased substantially after rearrangement.[130]

In addition to an outline of his "Public Library Reader Interest Arrangement," Hubbard offered practical suggestions for implementation, so that "going directly to each category that seems potentially interesting, each browser can flexibly apply his own unique and changing interest to scanning books—not cards." Among these suggestions were:

> Verbal category labels need not exceed eleven letters in width or two lines in depth.
>
> Non-sequential verbal categories can be put wherever they're most useful in a particular library at a particular time.

> Alphabetic subdivisions of a major category is often less confusing. ...Alphabetic subdivision can be by country, state, language, civilization, animal, sport, or any other appropriate category.
>
> Within each verbal subdivision I personally find it more efficient to leave the books in random order and use a scanning approach. But in a more meticulous arrangement it isn't necessary to emphasize authors. Arrangement by year of publication highlights the newest books and the earliest eyewitness accounts; it's particularly useful for a "U.S. Today" category....Biographies can be kept together in alphabetical order at the end of each subject category. An element of the critical appraisal lacking in present library cataloging can be provided by a qualitative arrangement ("three-star books first"). Or you can arrange by frequency of use, simply reshelving books at the beginning of their respective categories.[131]

In a later 1972 article, Hubbard presented an outline of a "Verbal Reader Interest Arrangement Utilizing Dewey Numbers," which was more conservative in its approach and resembled less a "Reader Interest Arrangement," as envisaged in his previous article, than a simplified, broadly classed DDC supplied with verbal rubrics on spine labels and shelf signs, reminiscent of the guiding proposals of Savage or the "Featuring" formerly practiced by the British National Bibliography (BNB).[132]

The fluidity of the concept of RIC is well illustrated by the just described examples, as well as by others cited in earlier sections of this paper. Thus, Williams could be joined by Briggs and Emunds as advocates of the subject classification of fiction. Indeed, Emunds proposed that "'center of interest' groupings should also be investigated, including those which do not fit into traditional classifications."[133] As Maltby noted of RIC: "It is conceivable that such a method could partly break down the often artificial barrier between fiction and nonfiction and satisfy those who want to abolish or reduce the huge alphabetical sequence of novels."[134]

The numerous variations on RIC attest to its suggestiveness and—as indicated by Maltby above—its great promise. Both Maltby and Dunkin have given RIC very serious consideration. Dunkin evaluated it with care:

> With regard to the focus on "reader interest," no classification will say that it is not useful to the reader. Indeed, we have seen that Sayers and Merrill insist that usefulness is a basic consideration. On the other hand, with RIC, as with the conventional schemes, there is no scientific demonstration that the result is actually as useful as is claimed. Indeed, there are only general and subjective opinions of public service people based on their interpretation of their experience with the scheme....
>
> The central idea of RIC is intriguing. Whether it does, indeed, achieve its goal and how much more expensive it is than conventional DDC or LCC, we do not yet know.[135]

Maltby, in the symposium on *"Classification in the 1970s"* stated: "It seems just possible that reader interest arrangement could combine an acceptable shelf order for branch libraries with an economical notation and that suitable research could generate a system based on the reader interest concept which could be applied, in fairly uniform manner, across a range of public lending libraries with the associated advantages which wide acceptance usually brings."[136]

None of the above adaptations of RIC need be invalidated because the Detroit Public Library no longer uses RIC. The concept of RIC—as with the "facet analysis" concept of Ranganathan's Colon Classification—has had far-reaching impact, regardless of lack of application in its original form or milieu.

Mathematical Formulas and Models for Shelf Arrangement (1966-1974)

On the whole, however, research interest in traditional shelf classification, especially for large academic and research libraries, does not seem great. Maltby and others have regretted this indifference and called for renewed efforts.[137] The prospect does not appear bright. Current theoretical research has been more concerned with problems other than the determination of patron needs in open-shelf collections and how classification can be applied to meet these needs more effectively. One such category of research is the application of mathematical formulas and models, drawn from nonlibrary data, to produce new patterns for shelf arrangement. Conventional shelf classification would be subsidiary or ignored.

Booth, applying Zipf's Law, taken from linguistics, has drawn various geometric patterns for library shelving to permit frequency-ordered arrangement.[138] The library is to be considered a push-down store in which a returned book is to be replaced at the head of the shelf, its continual replacement and retrieval to be made possible by computer records. Such arrangement obviously negates traditional shelf classification. Woodward, in a letter to the editor, commented on Booth's 1969 article: "There must be still some librarians who are not responsible for a mechanized library and who encourage readers to locate material on the shelves. ...There is a point that must be remembered when creating logical storage patterns and that is, that every care must be taken to ensure that the location of books reflects the use arising from need, and that amount of use is not dictated by the location of the book itself."[139]

Perhaps less radical than Booth's is Hazleton's suggestion that books be arranged in three dimensions: laterally by subject (e.g., Dewey numbers); horizontally by category (e.g., degree of difficulty); and longitudinally by category (e.g., degree of specificity or use frequency).[140] These dimensions seem to have been applied at least partially by even conservative librarians, for example, in children's collections, young adult collections, new popular works, and reference tools.

Mathematical models for shelving books by height and age were described in 1966 by Galton, who claimed that two or three properly chosen heights could increase storage efficiency by 38% or 47%, respectively.[141] He also determined that in his library, books published during the previous decade, 1954-64, circulated four times as frequently as earlier works. He recommended sampling of circulation files to yield models for book budgets, space provisions, hours of operation, reference service, and off-the-shelf storage. Gupta and Ravindran, in 1974, published a network model, based on operations research principles, to determine the optimum number of shelf heights for compact storage.[142] Russian researchers reported in 1970 on the development of models, based on call frequency of documents, for information service and file organization.[143]

Current Emphasis on Non-Shelf Classification: Austin (1971), Wilson (1972), et al.

Current research predominantly reflects acceptance of a dichotomy of classification for shelf and information retrieval. There emerges a consensus that the same scheme—or, at the very least, the same notation—cannot fulfill adequately bibliographical *and* bibliothecal *and* locational functions. The built-in contradictions have been described by Line and Bryant, Vann, Wilson, Maltby, Austin, and others. Bryant and Line reported in 1971 a system developed at Bath University Library to truncate the longer classification for shelf arrangement, while preserving full Universal Decimal Classification (UDC) numbers for subject retrieval through a machine-readable "mini-catalog." Similar truncation for shelf marks *v.* bibliographic notation has long been recommended by American authorities, e.g., by Fellows in 1929.[144]

The underlying difficulty is, of course, not new: the well-publicized constraint of linearity in traditional shelf classification. What does seem new is the abandonment of efforts—except for relatively minor adjustments like the truncation system of Bryant and Line—to bridge the gap between the classification of knowledge and that of books. Thus, Austin, after carefully

distinguishing shelf classification and information retrieval, devotes most of his essay "Two Steps Forward," in the 1971 edition of Palmer's *Itself an Education,* to the themes of "subject indexing" and "concept organization, " the latter phrase "introduced by Farradane to describe a file which bears no relation to shelf arrangement."[145] Austin and his colleagues from the British Classification Research Group (CRG) have concentrated their research on constructing indexes for classified files of surrogates: Coates's British Technology Index (BTI), Aitchinson's Thesaurofacet, Austin's PRECIS (Preserved Context Indexing System) for the BNB, Lynch and associates' Articulated Subject Index (ASI). Reviewing the Palmer-Austin work, Metcalfe described Austin's "Two Steps Forward" as "essentially a contradiction, not as Palmer introduces them, a continuation or an account of later classificatory developments, justifying a second edition of Palmer."[146]

The same research orientation is evident in the two recent state-of-the-art symposia, Wellisch and Wilson's *Subject Retrieval in the Seventies* and Maltby's *Classification in the 1970s.* In the former, Wilson describes the work of the CRG and distinguishes much like Austin:

> The alternative types of classification schemes available are: (a) universe of knowledge systems, which may also be called subject specification systems, and (b) universe of concepts systems, or concept identification systems....This has two significant consequences: (a) such a [concept identification] system is ideal for machine retrieval and (b) such a system is totally useless for shelf ordering because of the cumbersome notational strings. Therefore, if the machine information retrieval system is used for the subject analysis of documents in an information center in which browsing by users is a customary and allowed mode of operation, two systems are necessary.[147]

Although according to Wilson "there is at present no uniformity of thought within the Group about one kind of system versus the other,"[148] the outstanding recent achievements of the CRG seem to represent a preponderance of attention to the one not suited to browsing.

Four of the nine contributors to *Subject Retrieval in the Seventies* expressed opinions analogous to Wilson's: Wellisch, Soergel, Austin, Rigby.[149] Of the remaining four, only Aitchinson, developer of the English Electric Thesaurofacet, claims that her scheme, as well as those produced by others on similar lines, "may be used as a multi-purpose tool for conventional classified catalogues and shelf ordering as well as for coordinate indexing and computer applications."[150]

Contributors to *Classification in the 1970s* include Maltby, Vann, Austin—all of whom share in some degree the opinion that one classifica-

tion scheme or notation cannot be equally effective for bibliothecal *and* bibliographical organization.[151] Maltby again stated his position in a 1977 article in which he reexamined Fremont Rider's International Classification, designed for shelf classification, and concluded: "The requirements for a shelf classification cannot be met by a classification designed for catalogs and bibliographies....Little-used systems, such as Rider's, ought to be tested as shelf classifications alongside acknowledged standard schemes."[152]

Proposals for Shelf Classification Research (1937-73)

More than 40 years ago, Kelley outlined a series of research projects concerned with classification as applied in libraries for the presumed benefit of the reader. A typical sequence was as follows:

> Consider *Use* as a basis of classification and subject-cataloging. For what purpose has a book been written? What were the author's special qualifications, fields of interest, and experience? Who will use the book?
>
> Classify a large group of books according to the use that will be made of them, rather than according to their intrinsic subject-matter. Then, find out through the readers who have actually used the books, the exact nature of the use made of them. Confer, if possible, with the authors themselves, as to purpose of books.[153]

Other areas for investigation proposed by Kelley were: (1) the practical significance of the order of the major subject sequences if it were true that most libraries do not retain the order of Dewey's main classes on the shelves; (2) the comparative effectiveness of different kinds of notation for class symbols, perhaps to be determined by photography of eye movements; (3) the extent to which libraries using Dewey modify or shorten DDC numbers, such information to be obtained through a survey; (4)the feasibility of a broader shelf classification coupled with the greater specificity of a classed catalog; and (5) the degree to which Dewey can be used for special libraries or special collections of books.[154]

Almost all these proposals continued to be ignored, while others from later investigators were added to the research desiderata file. Thus, in 1965 Licklider, an inspirer of Project Intrex, suggested a series of browsing experiments to include comparisons of four "browseries" or browsing situations: (1) books on shelves; (2) the same content in microform with a computer catalog-index; (3) a manual catalog-index; (4) a console catalog-index. "In addition to the simple keeping of records, there should be some time-motion analysis and some follow-up interviewing."[155]

Licklider also proposed a number of "minor" experiments: (1) a "test of three browsing strategies" concerning browsing with the aim of finding something of value in connection with one's work";[156] (2) the "tailor-made browsery," i.e., to select a number of subjects and "prepare, for each subject, several special browseries";[157] (3) the "browser's diary," a proposal to employ 30-40 undergraduates to browse one hour a day and to record their own activity. "At the beginning of the year and again at the end of the year, the subjects would be interviewed and tested to determine profiles of their interests, aspirations and personalities."[158] Only a faint reflection of these proposals, insofar as shelf classification is concerned, seems to have emanated from the now-terminated Project Intrex.[159]

Apted cited Licklider's assessment of the purposive nature of browsing as "the period deliberately and regularly set aside for unplanned and relatively unhurried examination of material in the hope of discovering something or other." He also noted Licklider's claim that computerized browsing could automatically record for analysis "full details of the user's reactions to and uses of information"— a potential invasion of privacy, as pointed out by Apted.[160]

Morse, a pioneer in developing operations research for wartime needs, proposed in 1970 that a formula derived from search theory employed in spotting a submarine by patrol aircraft be used to separate a library collection into directly accessible "high-interest" and less accessible "low-interest" sections.[161] (Note the verbal resemblance to Reader Interest Classification!) The separation would be according to circulation rate and would produce groupings of 1000 or 2000 items which could be scanned in 15-30 minutes. Apted has commented that such sectionalization would contradict Celoria's advocacy of an undivided central library to foster "higher browsing." Apted concluded that "these two opposing views are a further indication that, at the research level at least, users do not form a homogeneous group, but require different facilities from the library according to their discipline."[162]

One might suggest that these different disciplinary needs are precisely the rationale for the numerous special, though still conventional, shelf classification schemes available, as well as for the broad *v.* close classification options provided by a general "neutral" scheme like DDC. Indeed, though Morse in 1973 reiterated that "the mean interest potential of a section, for the average browser, should be roughly proportional to the mean circulation rate of the books in a subject section,"[163] he added that different types of libraries will use different curves for generalist *v.* specialist users—or perhaps adopt a compromise.

Morse in 1972 had proposed that circulation statistics be a basis of measurement for the "degree of connectivity" of different book classes and so be used to improve shelf arrangement and browsing.[164] Items with the largest correlation indices should be put closest together. A Markov model of book use could predict the popularity of books. Morse felt that a maximum-sized subject section for browsing should number about 5000 volumes, and that weeding should be based on potential interest to browsers, that is, as indicated by circulation history. Circulation analysis of single and connected books thus could lead to a book classification grouping books optimally by user interest. (This could in theory provide a custom-designed scheme for every user.) Here again, one may note—as with Licklider's proposals—the threat to users' privacy. (One must admit that the same threat exists even now with apparently much more innocent data, such as a subscriber's "interest profile" submitted for a computerized SDI service. The lesson would seem clear: the danger lies not in the information but in the moral character of those who amass, disseminate and apply it. Even after legal protections are supplied, *quis custodet custodes?)*

Also, one might question the general theoretical validity of interpreting past use—even after disregarding, for the sake of argument, the problem of recording in-library use—as the chief determinant of future research needs in libraries. Such statistical methodology may result in self-fulfilling prophecy: rearrangements reflecting *past* experiences may create a preconditioning effect which would inhibit "serendipity" in browsing and pre vent research "breakthroughs." These basic theoretical, perhaps epistemological, questions at least deserve consideration, especially since, on a practical level, abstract mathematical formulas from nonlibrary fields would attempt to quantify and anticipate an intricate process of human consciousness interacting with physical sources of information.

Hyman in 1970 suggested that "the possibility of advanced theoretical research on the direct shelf approach and on 'browsing' would not seem promising if confined to traditional study of patron behavior at the shelves." He pointed out that the type of fundamental research proposed by Richmond on the mental associations of the patron while using the classificatory approach to library materials "would be more likely pursued by specialists in nonlibrary disciplines, e.g., neurophysiology and the psychology of learning."[165] (Perhaps a joint disciplinary research project might be in order.)

Nevertheless, one possibility might be a study of patron choice of materials in a situation "completely controlled as to collection content and where the choices would be instantaneously and accurately recorded. The com-

puterized store would attempt to simulate the contents and organization of an open-shelf collection."[166] Such an approach would resemble those suggested by Swanson and Licklider.[167] However, the artificiality of assigned tasks in a "totally" controlled environment might drastically vitiate the results. Perhaps a more realistic and simpler series of experiments could involve a "core collection" for students: "With the collection constant, various 'guiding' methods and schemes of broader or closer classification could be evaluated in relation to the direct shelf approach and browsing. For some tests the card catalog might not be made available. The tasks would be coordinated with the assignments of the instructor who would grade the results with special attention to the inclusion of relevant material."[168]

Occasionally, voices are raised almost plaintively to remind us of the prevalence of shelf classification and its neglect by classification researchers. In a 1974 letter to the editor of *Aslib Proceedings*, W.B. Woodward, Keeper of Science Books in the Durham (England) University library, appealed for advice in shelving his open-access book stock by UDC, which he found incapable of accommodating "both older, useful material and new items with a completely fresh approach to the same subject." He signed off with an SOS: "If anyone is experiencing the same dilemma, and intends to think about and tackle this problem with the intention of producing a working solution then I shall be glad to hear from them."[169]

A.C. Foskett has taken his stand: "Shelf Classification—Or Else!" He has suggested that DDC *and* LCC could be applied to the same collection, and also that two editions of DDC could coexist.[170] Maltby, as noted above, has called for research into the development of a new type of shelf classification which would take as its model the Detroit Reader Interest Classification. Even if a new scheme did not result, he felt that the products of the research could be applied to new editions of DDC. He has also, as noted above, recommended testing little-used systems for shelf classification like Rider's International Classification.[171] Line has proposed the formulation and testing of hypotheses on open access: (1) open access serves an educational purpose, a possible measure of this hypothesis being the number of books withdrawn from open-access libraries as compared with those withdrawn from closed-access libraries; (2) browsing becomes less feasible as collection size increases, to be tested by determining the number of books withdrawn as a result of browsing in various sizes of libraries; (3) serendipity yields material of vital interest to readers, to be tested by collecting examples and evaluating them quantitatively in comparison with those chosen by other means than browsing; and (4) browsing is more likely on the shelves than in bibliographies or catalogs.[172]

Survey of DDC Use in the United States and Canada (1975)

Vann, like Kelley more than 40 years ago, described how little is known of the use of DDC in individual libraries, but held out a hope: "Should the projected survey on the use of DDC in North America be implemented during the '70's, data on actual use of the fullness of Dewey, on the use of segmentation, and on tinkerings with notation which impede the usefulness of successive editions would offer guidance for possible new directions." She added the note: "Plans for the proposed survey are still in a formative stage as of 1971."[173]

In 1975 the long-awaited survey of the use of DDC in the United States and Canada was conducted. The survey was sponsored by the publisher of DDC, the Forest Press, Lake Placid Foundation, to mark the centennial of the first edition of DDC in 1876. Its four major objectives were:

> 1. to determine the extent of use of the DDC by United States and Canadian libraries of different sizes and types,
> 2. to obtain information about the application of the DDC to library collections,
> 3. to determine the problem areas in the application of the DDC for collections in these two countries, and
> 4. to ascertain to what extent the DDC is taught in library schools and what problems are encountered in teaching it.[174]

To achieve the first three objectives, a questionnaire of 112 items was mailed to 1876 American and Canadian libraries and processing centers of which 1152 responded. Follow-up telephone or personal interviews were conducted with all responding processing centers and large libraries (500,000 volumes or more). As might be expected from the many detailed technical questions—usually with numerous multiple-choice options—a great mass of data and opinion was accumulated. Apart from any criticism of the survey methodology or ambiguous wording of questions, many responses were inconsistent and even contradictory with others—not necessarily the fault of the survey instrument.

In basic assumptions, methodology and specific questions, the survey broke no new ground. It made no attempt to include nontraditional research approaches such as proposals for shelf classification research suggested earlier. Its aims, as implied in its major objectives, were the replication and updating of national library surveys described in the earlier sections of this paper. Findings were not, on the whole, surprising; usually they confirmed the professional literature. Although classification in North American libraries is known to be used almost exclusively for the shelves, the questionnaire in substance and wording might have been designed for libraries which used DDC only for classified catalogs. None of

the 112 questions included "browsing" or "direct access" or equivalents. Questions and answers in most cases expressed the concerns of theoreticians with organization of recorded knowledge and with attempted mirroring of this ever-changing universe in a classification system:

> Would you object to the introduction of other notational devices such as letters or signs (e.g., + and -) in future editions?[175] (Question 23)
>
> When two standard subdivisions apply to the same work (e.g., a directory of mathematics associations, a dictionary of data processing for engineering, a dictionary of methods of teaching piano) would it be satisfactory to you that: Both be used/Just one be used/No opinion (Question 38)
>
> Is it the policy of your library to add standard subdivisions when the subject does not approximate the whole content of the class number, e.g., an encyclopedia of worm gears, worm gears not having its own number? Yes/No/Sometimes/Do not know (Question 40).[176]

The ultimate presumed beneficiary of these cerebral operations, the reader at the shelves, seemed largely ignored or forgotten. The survey appeared to be examining classification practices as if libraries were classifying in a way they were not: for catalogs rather than shelves. However, in sometimes startling contrast, opinions added by respondents or reported by editor Comaromi through interviews provided occasional reminders of how classification is really used in our libraries: grouping of books *on shelves* for readers to find a recognizably logical sequence of related subjects and subject subdivisions. The following sampling of respondents' statements testified to awareness of browsing and direct access as primary concerns of at least some American and Canadian practitioners:

> Any system, including DDC, is only useful in that it groups materials in some kind of logical, easy-to-understand fashion for the user of the library.[177]
>
> I miss the mnemonic features of Dewey which make for good browsing. [LCC user][178]
>
> Doesn't work too well for browsing.[179]
>
> The practical librarian sees the books on the shelves all in one place—the best one.[180]

The gravest apprehensions of respondents arose not from how particular numbers were assigned by the Dewey Office at the Library of Congress, but with the many changes and reclassifications in each new DDC edition. Since almost no library could afford to reclassify its entire collection in accordance with every new edition, books on the same subject could be shelved under widely separated numbers: older works under the older numbers, newer ones under the changed numbers. The effect of such split collections on direct access was apparent to more than one respondent:

> The Dewey number is fast becoming nothing more than a location device—and an expensive one—...and we may as well simply assign

numbers as the books come in and build on the end of the collection.[181]

Entire subjects are moved from one end of the building to the other. Patrons are disserved. Browsing is heavy.[182]

I'll never take the attitude that it doesn't matter where I put it, you can always find it through the public catalog. That's absurd.[183]

Editor Comaromi, who conducted the follow-up interviews, contributed some extended comments on browsing and direct access, rather unexpectedly, considering the nature and structure of the questionnaire:

> Browsing is done by people at all educational levels. Its effectiveness must be severely curtailed where material on the same subject is not kept together. (The comment on browsing is based upon the common wisdom of librarians in public services.)[184]
>
> Though they would like to keep like material together, many have given up the attempt to do so. More will follow, I suspect. The public catalog has become much more important in subject searching; for the general, discipline approach at the shelf that was once possible is rapidly disappearing in the bulk of the Classification. General searches now have to be done at the catalog. Most if not all library users other than librarians are not aware of this and are consequently disserved. (What is not realized is that the subject catalog was devised to allow specific subject searches, and now general searches by discipline are virtually impossible.)[185]

A close reading of the survey report can be dispiriting. Respondents expressed grave concern over the instability of DDC editions. A feeling is conveyed that classification may well be purposeless, that the act of classifying may be meaningless busywork. If such doubts are directed at the intellectual rationale of the scheme, how much more justifiably might they be directed at the chief use of the scheme in our libraries: physical placement of books for readers! One is reminded of Jevons's oft-quoted dictum that library classification is a logical absurdity.[186]

These are no doubt exaggerated reactions, but they perhaps point to a remedy: the emphasis on library classification as a necessarily imperfect but nonetheless practical means of organizing a collection on shelves for direct access, if this seems the principal application in most libraries. The ideal classification for nonshelf purposes, e.g., for a classified catalog, could then be pursued differently. Acceptance of this concept might well mean restructuring future editions of DDC, at least those editions intended for bibliothecal purposes.

This most recent national survey of classification use bears out the opinions cited earlier in this paper on the inevitable dichotomy between classification for the shelves and that for information retrieval. To attempt to use the same scheme for both purposes is to produce a seemingly hopeless "double bind," evident in many of the above respondents' statements.

Centennial DDC Conferences (1975-76)

Two conferences celebrated the centennial of the first edition of DDC: the first, held November 1975, was part of the Allerton Park Institute series, and was sponsored by the University of Illinois Graduate School of Library Science and Forest Press, publisher of DDC; the second, held September 1976 in Banbury, England, was sponsored by Forest Press and the Library Association. Neither paid much attention to shelf classification, understandably so for the latter, since European libraries have traditionally stressed bibliographical rather than shelf classification. This conference was largely concerned with administrative problems of applying DDC editions internationally.

The American conference aimed "to provide a forum for an in-depth discussion of classification systems in general and of the DDC in particular."[187] Most papers were historical or theoretical, e.g., "The Historical Development of the Dewey Decimal Classification System," "The Library of Congress Classification Scheme and its Relationship to Dewey," and "The Role of Indexing in Subject Retrieval." One contribution, however, was a summary of the previously discussed *Survey of the Use of DDC in the United States and Canada.*[188] This summary included the paragraph quoted above on the disappearance of the discipline approach at the shelves and its illogical replacement by general searches at the catalog. This was almost the only mention in the proceedings of DDC applied to shelves of American and Canadian libraries.

Interestingly, even such brief notice must have sparked considerable attention. When the chairperson of the planning committee for the conference summarized the gist of the unpublished panel discussion, two of the five summarizing paragraphs referred to browsing and direct access:

> 1. While it is agreed that catalogs and automated retrieval systems may be more important to the retrieval of subject information in the future than they have been in the past, the need still exists for some shelf browsing capabilities, especially in public library situations....
> 4. In studying the results of developments in classification research in other countries, it becomes apparent that classification is not fully utilized in the United States. Only the surface of its potential contribution has been scratched. The need for browsing capability on the shelf has contributed to the way classification has developed in the United States. The confusion over the function of shelf arrangement and subject analysis needs to be clarified by further study and examination.[189]

One might ask whether the conference did not proffer the appropriate opportunity for inviting and presenting exactly this study and examination, whose need has been clear for most of the century-long existence of

DDC. The last sentence in the quotation above could have been written 50 years ago! The conference thus represented another lost opportunity, and also confirmed the impression that American librarians continue to ignore the reality of the use of DDC in the country of its origin, while they concentrate on theoretical and philosophical matters of probably lesser significance to the majority of DDC libraries in America and Canada. It may not be invidious to note that most of the contributors, and all those from the United States and Canada, were teachers. A practitioner from the Library of Congress presented a preliminary report on automated subject searching, but the manuscript was not made available for publication.[190]

Participants in the British conference were forthright in acknowledging their lesser use of shelf classification. Sweeney, describing the application of DDC in Britain, indicated two points vital for understanding the view of most British librarians toward classification: "(1) The secure hold of DDC as the means of shelf arrangement in British libraries....(2) The reliance on a classified catalogue as the main means of organizing the subject content of our libraries. Over two-thirds of all our libraries rely on a classified catalogue for this purpose and the arrangement of the National Bibliography is a reflection of this preference."[191] Jesper, Chief Cataloger, Birmingham Public Libraries, reiterated: "The Classified Catalogue seems to me to be an essential counterpart to a classification scheme. A book can indeed only be placed in one position on the shelves; but in the catalogue it can appear in many. It allows for the provision of subject analyticals just as the Name Catalogue allows for the provision of name analyticals."[192] An interesting exception was provided by Pelletier of the Bibliothèque Nationale, Paris, who stated that most French public libraries used DDC "for classifying works on the shelves, and not for purposes of documentary search....Rather than classified catalogues, the librarians prefer alphabetical subject catalogues, which are easier for the readers to consult."[193]

The British conference was accordingly more obviously justified in devoting most attention to administrative and theoretical problems of the various editions and translations of DDC. Overlap with the American conference was noticeable. Thus, a summary, though very brief, was again given of *A Survey of the Use of DDC in the United States and Canada.* Downing and Austin participated in both conferences, and Downing was coeditor of the British proceedings. And finally, Austin, as he had in the American conference, insisted on lack of usefulness of *library* classification for information retrieval:

> It should not come as any surprise if we conclude that...DC numbers are not the best tools for searching mechanised files. But we need to remember that these numbers were not intended for this purpose; as Ben

> Custer noted in his introduction to the schedules, these are "mark-and-park" symbols intended for organising libraries. We have no right to complain if we find that a knife is not the most efficient tool for eating soup.[194]

However, Austin advised: "I doubt whether a library classification (DC or otherwise) could ever totally satisfy these new needs, and it also seems likely that any changes made to the schedules for the sake of mechanisation could very well mean the end of the Decimal Classification."[195]

The combined effect of the two conferences on the outsider can be perplexing and discouraging: the Americans use classification for the shelves but discuss it as if it were being used for the catalog; the British and most Europeans apply classification chiefly to the catalog, but the British do not abandon it as a locational device for the shelves. All complain of inadequate specificity, accuracy and modernity while bitterly protesting impractical complexity and excessive revision. With a polite plague on both houses, Austin brands both shelf and catalog applications unfit for modern information retrieval. The question is left: for what and for whom are the generally accepted library classification schemes being created?

Future of Shelf Classification

At the present time, the future of research into shelf classification is decidedly unpromising, particularly in terms of its use in large academic and research libraries. The paradox continues: bibliographical expansion of our general schemes proceeds apace, but in the United States, at least, the end product is a ZIP Code for the shelves. Barring a possible reorientation in our general classification schemes—based on careful and open-minded research into their predominant use for the shelves—our shelf classification problems may be solved for us in a drastic fashion. The recent rapid development of computerized on-line multiple access to bibliographic records—with *coordinated* multiple access made possible through Boolean search techniques—has intensified doubts as to the desirability of large shelf-classified collections. (The proposed closing by LC of its card catalogs is an omen not to be ignored.) As Metcalfe has expressed it:

> If there is a Gordian knot of thesis and antithesis without synthesis, technological advance may be cutting it; if the literature media become videotapes for projection, and so not directly browsable, and if the tapes are mechanically retrievable from stacks as they can be, then at least two pretty ones go at one fell swoop, as rolls went before codices and manuscript before print; classification might then come into its own as indexing.[196]

However, for the foreseeable future, one may anticipate the continuance of shelf classification as a means to the rational ordering of directly accessible library materials, especially in smaller and subject-specialized collections. (Even larger libraries might make part of their collections open-shelf.) This probability is strengthened by the advent of the computerized catalog. As Ganning summarized Atkinson's statements at the 1975 institute on "The Catalog: Its Nature and Prospects," the remote-access terminals of the electronic catalog would make feasible the full decentralization of the large research library, which would then consist "of as many as forty to fifty units each matching the society it would serve. Each unit would ideally consist of a single librarian, a few clerks and students, and an adequate collection. The outer limit on this unit would be twelve people."[197] Thus the departmentalization of large university libraries—long decried because it created excessive fragmentation of holdings along with the need for very expensive, cumbersome, duplicative bibliographic controls—could now be justified economically as well as intellectually. Huge collections could then benefit again from the concept of the custom-designed nineteenth-century seminar library, where the appropriateness of shelf-classified browsable collections is obvious.

A final reason might be adduced for the probable survival of shelf classification, in at least simplified form, in even the most sophisticated collections, namely, human reluctance to surrender to manual and computerized surrogates our desire (need?) for physical contact with library materials. Readers want to be able to handle directly whenever possible the particular shelved items sought, and also to *browse* among possibly relevant materials, even though perhaps more adequate bibliographic means are available. (Also operating may be an indomitable spirit of intellectual independence which refuses to accept classification decisions imposed "from above" and which insists on seeing and verifying personally. Thus, one might discover different or new subject relationships not chosen or sanctioned by the official classification scheme.)

Negatively put, humans have an aversion to or fear of the "black box." As a practical result, readers and librarians have mustered considerable resistance to microforms and computerized records. Thus, as many others have done, Bierman in 1975 predicted that "exclusively microimage catalogs for large collections will not be acceptable because of [among other reasons] the user interface and acceptance problems."[198] Bierman's prediction would seem also to apply to the "image catalogs" represented by today's on-line CRT computer terminals.

As Hyman and other investigators of the browsing function have repeatedly found, there is an ineradicable though "scientifically" unvalidated demand for direct access to library materials:

> The validity of the open-shelf library or the direct shelf approach must, on the evidence, be accounted a postulate, rather than an objectively demonstrable truth. American preference is unquestionable—whether that of the browser in a public library, the reader services librarian in a reference collection, or the faculty member or student in an academic institution. Nevertheless, how the direct shelf approach is implemented remains a matter replete with unresolved issues of theory and practice, both bibliographical and bibliothecal.[199]

We might draw some comfort from the thought that readers' stubborn (though perhaps not always logical) need for directly consulting library materials may extend to readers' need for directly contacting human librarians.

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